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## NOTICE OF ALLOWANCE AND FEE(S) DUE

22850 7590 04/02/2012  
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

EXAMINER

WEST, JEFFREY R

ART UNIT

PAPER NUMBER

2857

DATE MAILED: 04/02/2012

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/593,784

09/22/2006

Yuriko Suzuki

296731US40PCT

4031

TITLE OF INVENTION: METHOD, DEVICE AND PROGRAM FOR PRESENTING INNER FORCE SENSE AND PROGRAM

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1740	\$300	\$0	\$2040	07/02/2012

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.**

**THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.**

### HOW TO REPLY TO THIS NOTICE:

#### I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**

# **PART B - FEE(S) TRANSMITTAL**

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE  
Commissioner for Patents  
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Alexandria, Virginia 22313-1450  
or Fax (571)-273-2885**

**INSTRUCTIONS:** This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

22850 7590 04/02/2012

**OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.**  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

## **Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/593,784	09/22/2006	Yuriko Suzuki	296731US40PCT	4031
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TITLE OF INVENTION: METHOD, DEVICE AND PROGRAM FOR PRESENTING INNER FORCE SENSE AND PROGRAM

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional	NO	\$1740	\$300	\$0	\$2040	07/02/2012
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EXAMINER	ART UNIT	CLASS-SUBCLASS
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WEST, JEFFREY R	2857	702-041000
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1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 \_\_\_\_\_
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 \_\_\_\_\_
- 3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature \_\_\_\_\_ Date \_\_\_\_\_

Typed or printed name \_\_\_\_\_ Registration No. \_\_\_\_\_

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,784	09/22/2006	Yuriko Suzuki	296731US40PCT	4031

  

22850	7590	04/02/2012
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314		

  

EXAMINER	
WEST, JEFFREY R	

  

ART UNIT	PAPER NUMBER
2857	

  

DATE MAILED: 04/02/2012

## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 815 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 815 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

## Privacy Act Statement

**The Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/593,784	SUZUKI ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Jeffrey R. West	2857	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed August 10, 2011.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are 1-3,5-7,9-11 and 13-15.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
    3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_.

Applicant has **THREE MONTHS FROM THE "MAILING DATE"** of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. <input type="checkbox"/> Notice of References Cited (PTO-892)</li> <li>2. <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)</li> <li>3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br/>Paper No./Mail Date <u>06/15/11</u></li> <li>4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br/>of Biological Material</li> </ol> | <ol style="list-style-type: none"> <li>5. <input type="checkbox"/> Notice of Informal Patent Application</li> <li>6. <input type="checkbox"/> Interview Summary (PTO-413),<br/>Paper No./Mail Date ____.</li> <li>7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment</li> <li>8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance</li> <li>9. <input type="checkbox"/> Other ____.</li> </ol> |
|---|---|

/Jeffrey R West/  
Primary Examiner, Art Unit 2857

## **DETAILED ACTION**

### **EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.
2. Authorization for this examiner's amendment was given in a telephone interview with Mr. Sameer Gokhale (Reg. #62618) on March 26, 2012.
3. The application has been amended as follows:
  - In claim 3, lines 1-2, "Claim 1 or 2" has been changed to ---Claim 2---
  - In claim 7, lines 1-2, "Claim 5 or 6" has been changed to ---Claim 6---
  - In claim 9, line 5, "the plane" has been changed to ---a plane---
  - In claim 11, line 2, "Claim 9 or 10" has been changed to ---Claim 10---
  - In claim 13, line 4, "distance or vector" has been changed to ---distance---
  - In claim 14, line 10, "distance or vector" has been changed to ---distance---
  - In claim 14, line 11, "a receiver" has been changed to ---the receiver---
  - In claim 15, line 6, "distance or vector" has been changed to ---distance---
4. Claims 1-3, 5-7, 9-11, and 13-15 are considered to be allowable over the cited prior art for the following reasons:

Suzuki et al, "Arrayed Air Jet Based Haptic Display: Implementing an Untethered Interface" discloses a force feedback method comprising: placing a receiver at a predetermined height above a plurality of nozzles arranged on a plane, the receiver including a concave center unit that declines radially outward from an axis of symmetry of the receiver to an outer border of the concave center unit, such that the shape of the concave center unit is a hemisphere (page 1, column 2, lines 17-25 and Figures 1 and 2), selecting a nozzle from among a plurality of candidate nozzles arranged on the plane, the selected nozzle having a smallest distance between the selected nozzle and the axis of symmetry of the receiver (page 2, column 1, lines 3-17 and 38-48, and Figures 1 and 2), jetting a gas or a liquid from the selected nozzle upon an inclined side surface unit of the receiver to convey a force in a direction perpendicular to a direction of the jetting gas or liquid toward the axis of symmetry of the receiver (i.e. due to the curvature of the receiver, when the air hits the curved side of the receiver, the force received inherently includes a perpendicular force) (page 1, column 2, line 17 to page 2, column 1, line 2, page 2, column 1, lines 3-17 and 38-48, and Figures 1 and 2).

U.S. Patent No. 4,919,507 to DeBerg teaches a windmill comprising a rigid air receiver (column 4, lines 1-3) including a concave center unit (i.e. "24A") that declines radially outward from an axis of symmetry of the receiver to an outer border of the concave center unit (column 2, lines 52-59, column 3, lines 23-28, and Figure 3) and an inclined side surface unit (i.e. inclined side surface of "26A") that inclines

radially outward from the outer border of the concave center unit (column 2, lines 52-59, column 3, lines 23-28, and Figure 3).

JP Patent Application Publication No. 2004-157677 to Iwaki et al. teaches a multi-flexible driving mechanism and virtual reality system for receiving force caused by jets of air as part of a force feedback apparatus (0001, lines 1-4 and 0010, lines 1-9) wherein a receiver is provided with a deformation mechanism for changing a position or an orientation of the inclined side surface unit (0012, lines 1-8 and 0014, lines 1-6), the force feedback apparatus further comprising receiver side surface unit control means for controlling the deformation mechanism according to the position or the orientation of the receiver measured by the receiver measurement unit (0023, lines 1-7, 0027, lines 1-16, and 0030, lines 1-11).

U.S. Patent Application Publication No. 2004/0164960 to Jacobus et al. teaches a force feedback system and actuator power management.

U.S. Patent No. 6,433,771 to Yocum et al. teaches haptic device attribute control.

U.S. Patent No. 5,583,478 to Renzi teaches a virtual tactile system.

U.S. Patent No. 6,046,726 to Keyson teaches a virtual workspace with user-programmable tactile feedback.

U.S. Patent No. 5,459,382 to Jacobus et al. teaches a method and system for providing a tactile virtual reality and manipulator defining an interface device therefore.

JP Patent Application Publication No. 2001-022499 to Suzuki et al. teaches an inner force sense presenting device by wind pressure in virtual space.



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Amemiya et al., Portable Tactile Feedback Interface Using Air Jet” teaches portable force feedback displays.

With respect to claims 1-3, 9-11, 13, and 15, while the cited prior art teaches many of the features of the claimed invention, none of the cited prior art teaches, or suggests, a receiver including a concave center unit that declines radially outward from an axis of symmetry of the receiver to an outer border of the concave center unit, such that a shape of the concave center unit is a hemisphere, and an inclined side surface unit that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry and selecting a nozzle for which  $|V_{PN}|$  is the smallest from among candidate nozzles on a plane that satisfy  $R1 \leq |V_{PN}| \leq R2$  and  $0 \leq |\theta_{ij}| \leq \gamma$  wherein  $|V_{PN}|$  indicates a distance between a candidate nozzle and the axis of symmetry of the receiver,  $R1$  indicates a distance between the axis of symmetry of the receiver and an inner border of the inclined side surface unit,  $R2$  indicates a distance between the axis of symmetry of the receiver and an outer border of the inclined side surface unit,  $|\theta_{ij}|$  indicates an absolute value of an angle between a first direction from the candidate nozzle to the axis of symmetry of the receiver and a second direction of a force to be provided to the receiver, and  $\gamma$  indicates a predetermined value for the angle and jetting a gas or a liquid from the selected nozzle upon the inclined side surface unit of the receiver to convey a force in a direction perpendicular to a direction of the jetting gas or liquid toward the axis of symmetry of the receiver.

With respect to claims 5-7, while the cited prior art teaches many of the features of the claimed invention, none of the cited prior art teaches, or suggests, a receiver means including a concave center unit that declines radially outward from an axis of symmetry of the receiver means to an outer border of the concave center unit, such that a shape of the concave center unit is a hemisphere, and an inclined side surface unit that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry, the inclined side surface unit for conveying a force perpendicular to a direction of a jetting gas or liquid toward the axis of symmetry of the receiver means, and jet control means for selecting a nozzle for which  $|V_{PN}|$  is the smallest from among candidate nozzles on a plane that satisfy  $R1 \leq |V_{PN}| \leq R2$  and  $0 \leq |\theta_{ij}| \leq \gamma$  wherein  $|V_{PN}|$  indicates a distance between a candidate nozzle and the axis of symmetry of the receiver means,  $R1$  indicates a distance between the axis of symmetry of the receiver and an inner border of the inclined side surface unit,  $R2$  indicates a distance between the axis of symmetry of the receiver and an outer border of the inclined side surface unit,  $|\theta_{ij}|$  indicates an absolute value of an angle between a first direction from the candidate nozzle to the axis of symmetry of the receiver and a second direction of a force to be provided to the receiver, and  $\gamma$  indicates a predetermined value for the angle and for controlling a jetting means for jetting the gas or a liquid from the selected nozzle.

With respect to claim 14, while the cited prior art teaches many of the features of the claimed invention, none of the cited prior art teaches, or suggests, a receiver means including a concave center unit that declines radially outward from an axis of symmetry of the receiver means to an outer border of the concave center unit, such that a shape of the concave center unit is a hemisphere, and an inclined side surface unit that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry, a controller to select a nozzle for which  $|V_{PN}|$  is the smallest from among candidate nozzles on a plane that satisfy  $R1 \leq |V_{PN}| \leq R2$  and  $0 \leq |\theta_{ij}| \leq \gamma$  wherein  $|V_{PN}|$  indicates a distance between a candidate nozzle and the axis of symmetry of the receiver,  $R1$  indicates a distance between the axis of symmetry of the receiver and an inner border of the inclined side surface unit,  $R2$  indicates a distance between the axis of symmetry of the receiver and an outer border of the inclined side surface unit,  $|\theta_{ij}|$  indicates an absolute value of an angle between a first direction from the candidate nozzle to the axis of symmetry of the receiver and a second direction of a force to be provided to the receiver, and  $\gamma$  indicates a predetermined value for the angle and to control the selected nozzle to jet the gas or liquid upon the inclined side surface unit to convey a force perpendicular to a direction of the jet gas or liquid toward the axis of symmetry of the receiver.

5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

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accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey R. West whose telephone number is (571)272-2226. The examiner can normally be reached on Monday through Friday, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Schechter can be reached on 571-272-2302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jeffrey R West/  
Primary Examiner, Art Unit 2857

March 26, 2012